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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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03/29/2001

Yasuo Okutani

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01/26/2005

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EXAMINER

ARMSTRONG, ANGELA A

ART UNIT

PAPER NUMBER

2654

DATE MAILED: 01/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/819,613	<b>Applicant(s)</b> OKUTANI ET AL.	
	<b>Examiner</b> Angela A. Armstrong	<b>Art Unit</b> 2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 September 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 22-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 4,5,11 and 12 is/are allowed.
- 6) ☒ Claim(s) 1-3,6,8-10,13-16,22-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 20, 2004 has been entered.

### ***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1, 6, 8, 13, 15, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komori et al (US Patent No. 5,812,975) in view of Komori et al (US Patent No. 5,787,396) and further in view of Chu (US Patent No. 6,374,210).

5. Regarding claims 1, 8, and 24-25, the state transition model design and voice recognition of Komori '975 (column 3 lines 32-38) reads on the feature of HMM learning means for computing HMMS of speech segments with information indicating a phonetic environment (col. 3, lines 45-49) and (column 6 Lines 52-53) reads on the feature of segment recognition means for performing segment recognition of the speech segments on the basis of the HMMS of the phonemes.

Komori '975 does not mention registering segments. The speech recognition method of Komori '396 (column 4 Lines 24-30) reads on the feature of registration segment determination means for determining a speech segment to be registered in a segment dictionary in accordance with a segment recognition result of that segment recognition means.

It would have been obvious to a person of ordinary skill in the art of speech signal processing at the time of the invention to apply the method/teachings of Komori '396 to the system of Komori '975 so that differences in phone environments –such as preceding and succeeding phones – can be classified finely.

With regard to the additional feature of the claim that registration segmentation means for determining (selecting) a speech segment used in the computation of the HMMS by the HMM learning means and registering the speech segment in a segment dictionary in accordance with (the) segment recognition result (of the segment recognition means), Komori et al indicates that HMM makes a contribution to registering a speech segment in a segment dictionary (105-108 in figure 1, 204-208 in figure 2, etc.) without disclosing the mechanism depicted. Chu, with the invention for the automatic segmentation of a text, reads on this further feature of registering the

Art Unit: 2654

speech segment in a segment dictionary with the update function (140 in figure 1 - see column 7 lines 30-33). It would have been obvious to a person of ordinary skill in the art of speech signal processing at the time of the invention to apply the method/teachings of Chu to the device/method of Komori et al to incorporate new words/segments into the segment Lexicon (dictionary).

Regarding claims 6 and 13 as understood by the Examiner; the claims are set forth with the same Limits as claims 1 and 8, respectively. Komori '396 (2032 in figure 8) reads on the feature of speech segments having likelihood not Less than a predetermined value registered in the segment dictionary which would have made it obvious to a person of ordinary skill in the art of speech signal processing at the time of the invention to apply the method and/or teachings of Komori '396 to the system of Komori '975 so as to have recognition results reflect an acceptable comparison.

Regarding claim 15, the claim is set forth with the same limits as claim 8. Komori '975 (col. 3, lines 14-19) reads on the feature of a computer readable storage medium storing a program for implementing a method cited.

Regarding claims 23 and 26, Komori '975 (col. 3, lines 14-19) reads on the feature of a computer readable storage medium storing a program for implementing a method cited.

6. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komori et al (US Patent No. 5,812,975) in view of Komori et al (US Patent No. 5,787,396) and further in view of Chu (US Patent No. 6,374,210) and further in view of Rosenberg ("Connected Sentence

Art Unit: 2654

Recognition Using Diphone-Like Templates” International Conference on Acoustics, Speech, and Signal Processing, April 1988).

7. Komori is silent on the feature of diphones or biphones. Rosenberg (lines 7-9 left column page 473) reads on the feature that segment recognition means adopts diphones as units of the phonemes, categorizes speech segments in four categories CC, CV, VC, VV (C: a consonant, V; a vowel), and performs segment recognition in each category. It would have been obvious to one of ordinary skill in the art of speech signal processing at the time of the invention to apply the method/teachings of Rosenberg to the device and/or method of Komori and Chu because defining units larger than phones will be easier to work with, segment and label by virtue of containing greater variations and context effects.

8. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komori '975 in view of Komori '396 and further in view of Chu and further in view of Tominaga (U.S. Patent 5,311,429 A).

9. Regarding claims 3 and 10, the claims are set forth with the same limits as claims 1 and 8, respectively. Komori '975 does not mention registering segments.

The speech recognition method of Komori '396 (column 4 lines 24-30) reads on the feature of determining a speech segment to be registered in a segment dictionary in accordance with a segment recognition result of that segment recognition. The maintenance support method and apparatus for natural language processing system of Tominaga (column 11 lines 19-36) reads on the feature that checks if a speech segment pattern which matches a speech segment that

Art Unit: 2654

is not successfully recognized by that segment recognition means, and registers that speech segment in the segment dictionary if the corresponding speech segment pattern is found.

Therefore, it would have been obvious to a person of ordinary skill in the art of speech signal processing at the time of the invention to apply the method/teachings of Komori '396 & Tominaga to the device/method of Komori '975 to avoid duplicate entries.

10. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komori '975 in view of Komori '396 and further in view of Chu and further in view of Richardson (U.S. Patent 5,926,784 A).

11. Regarding claims 7 and 14; the claims are set forth with the same limitations as claims 6 and 13, respectively. Komori '975 does not mention registering segments.

In natural language parsing using Podding, Richardson (Col. 1, lines 21-25) reads on the feature that registers, in the segment dictionary, speech segments having upper values (claims 39 and 41) obtained by normalizing the likelihood by durations of the speech segments or likelihood having the values not less than a predetermined value.

It would have been obvious to a person of ordinary skill in the art of speech signal processing at the time of the invention to apply the methods/teachings of Richardson to the device/method of Komori and Chu to improve the efficiency by assigning probabilities to syntax rules.

Art Unit: 2654

12. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komori '975 in view of Komori '396, Chu and Tominaga and further in view of Fukada et al (US Patent No. 5,845,047) and Huang et al (US Patent No. 5,913,193).

13. Regarding claim 16, the claim is set forth with the same limits as claim 8. The feature of a segment dictionary in which speech segments are registered is cited in claim 8 and the rejections are applied to this claim for the same reasons.

Where Komori is silent on the subject of language analysis, Tominaga (column 3 lines 46-56) reads on the feature for performing language analysis of input text data.

Where Komori is silent on the subject of prosody, Fukada et al (column 6 Line 59) reads on the feature of generating prosody on the basis of an analysis result of that language analysis means and the runtime acoustic unit selection for speech synthesis of Huang (column 3 lines 1-4) reads on the feature that search that segment dictionary on the basis of the prosody generated by that prosody generation means to select corresponding speech segments and, with (column 1 line 66) reads on modifying and concatenating the speech segments selected by that speech segment selection means and (132 in figure 5) for reproducing speech on the basis of the result modified by that speech segment modification/concatenation means.

It would have been obvious to a person of ordinary skill in the art of speech signal processing at the time the of the invention to apply the method/teachings of Tominaga, Fukada, and Huang to the device/method of Komori and Chu, so as to improve the quality of synthetic speech by considering additional attributes of language.



Art Unit: 2654

14. Claim 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komori '975 in view of Komori '396 and further in view of Chu and further in view of Huang et al (U.S. Patent 5,913,193 A).

15. Regarding claim 22, Komori is silent as to speech synthesis. Huang (element 36 in figure 1) reads on the feature of producing synthetic speech using the segment dictionary (22→36 in figure 1) ... which would have made it obvious to a person of ordinary skill in the art of speech signal processing at the time of the invention to apply the method/teachings of Huang et al to the device/method of Komori & Chu so as to generate natural-sounding speech.

#### ***Allowable Subject Matter***

16. Claims 4-5 and 11-12 are allowed.

#### ***Conclusion***

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela A. Armstrong whose telephone number is 703-308-6258. The examiner can normally be reached on Monday-Thursday 7:30-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2654

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Angela A. Armstrong  
Examiner  
Art Unit 2654

AAA  
January 13, 2005

*Angela Armstrong*